

Governor Blunt's Bus Safety Task Force



August 2005

**SCHOOL BUS SAFETY TASK FORCE
REPORT TO GOVERNOR MATT BLUNT
AUGUST 19, 2005**

Directive From the Governor

On May 12, 2005, following three serious school bus accidents in Missouri, one of which resulted in death and serious injury, Governor Matt Blunt created this School Bus Safety Task Force. The Governor charged the task force with conducting a comprehensive review of the current status of school bus safety in the state of Missouri and if warranted, to make recommendations for future improvements.

From the outset, members of the task force were unanimous in their resolve that any and all recommendations made by the task force would be based on the latest recognized data and scientific studies and not merely upon emotion or anecdotes.

Task Force Members

The following is a list of individuals who served on the School Bus Safety Task Force.

Mark S. James, Chairman
Director, Dept. of Public Safety
Jefferson City, Missouri

Edward Hillhouse, Ph.D.
Presiding Commissioner of Franklin County
Villa Ridge, Missouri

Robert P. Baine, Jr
County School District Attorney
Hazelwood School District
Florissant, Missouri

Sherry Huffman
Elementary School Adm. (Retired)
Hartsville R-III School District
Hartsville, Missouri

John T. Davis
Director of Transportation
Independence School District
Independence, Missouri

Vicky Williams
Highway Safety Division
Missouri Dept. of Transportation
Jefferson City, Missouri

Leanna Depue, Ph.D.
Director, Missouri Safety Center
Central Missouri State University
Warrensburg, Missouri

Tina Zubeck
President, MO Parent Teachers Assoc.
School Board Secretary for Platte County R-3
Platte City, Missouri

Representative Tim Flook
34th District
Liberty, Missouri

Margi Bilyeu
Department of Public Safety
Jefferson City, Missouri

Current Status of Student Transportation in Missouri

The task force finds that public student transportation in the state of Missouri is the safest means of transportation available for students traveling to and from school. Irrefutable statistical data exists indicating students are safer being transported to and from school in school busses than by any other means.

The task force lauds the commitment and performance of Missouri's school bus drivers who do a very difficult job, often, for little remuneration.

According to the Missouri Department of Elementary and Secondary Education (DESE) and the Missouri State Highway Patrol (MSHP), 11,939 school buses were inspected in the State of Missouri during 2005. Of these buses, 4,562 were contracted school buses, 7,197 were school district or state school operated buses, and 180 were Head Start or private school buses.

DESE reports that in 2005, the average age of school buses in Missouri was 8.11 years as compared to 7.77 years in 2002, and 6.86 years in 1992. DESE attributes the increased age in fleet to decreased funding for transportation needs. According to DESE, funding for transportation has decreased from 80% of the funding formula in 1991, to an estimated level of 52% of the formula for the upcoming 2005-2006 school year.

DESE also reported that an average of 548,319 students were transported by school buses daily in Missouri during the 2004-2005 school year. During this same reporting period, these buses traveled 120,118,956 miles at a total cost of \$337,355,662. Based on these figures, DESE estimates the cost of transporting students at \$2.73 per mile and \$544.67 per student annually.

Injury and Fatality Data

Injuries to children (age under 19) in school bus crashes in Missouri were studied using 2002-2003 Statewide Traffic Accident Records System (STARS) motor vehicle crash records provided by the Missouri State Highway Patrol, and Crash Outcome Data Evaluation System (CODES) data consisting of STARS crash records linked to hospital inpatient and emergency room records for 1999, 2001 and 2003. The CODES data are developed by the Department of Health and Senior Services (DHSS) under the auspices of the National Highway Traffic Safety Administration (NHTSA). Using special software that NHTSA provides, STARS records are linked to hospital records. Essentially, if a person is in a crash and is then admitted or seen in the emergency room, they should have a record in both the STARS and hospital databases. The software is used to locate both records in order to link them together into a single record.

The two years of STARS data not linked to hospital records were used because they contain information on the number of occupants in a vehicle, and this has been available only since 2002. The CODES data were used to look at the types of injuries incurred by child passengers of school buses that crashed. Multiple years of data were used in the analysis of both databases so that the results would not be affected by unusual patterns occurring in any one year. The CODES data are not available for every year due to the resources required to link and analyze the data, so the three most recent years available were used. Similarly, STARS data for 2002-2003 were the most recent data available when this analysis was initiated. Both the STARS and the CODES data record information on crashes that occur in Missouri.

2002-2003 STARS Records

The 2002-2003 non-linked STARS records indicated that there were 2,619 school bus crashes in Missouri, or slightly over 1,300 per year. Of these, 167 crashes, or 6.4 percent, resulted in injuries to 718 children--359 per year. The exact number is uncertain, since 584 (81%) of these records characterized the child's injury as 'probable injury but not apparent', the least severe level of injury. The rest were marked as either 'disabling injury' or 'evident injury, not disabling'.

Not all school buses in crashes are carrying passengers, and if they are, the passengers may not all be children. The STARS records contain information on passengers only if they are injured, making it difficult to determine how risky it is for a child to ride in a school bus. Beginning with 2002, the STARS records do indicate the number of occupants that are in a vehicle involved in a crash, though not how old they are. For the 2,619 crashes noted above, there were 1,624 school buses that were recorded as having more than one occupant. Of these 1,624 buses involved in crashes, records for 168, or 10.3 percent, noted at least one injured child.

The value of safety belts in buses could not be studied. Very few of the small or large buses were recorded in the STARS data as having safety belts for children.

CODES Records

According to the 1999, 2001 and 2003 CODES data, there were 4,307 crashes, or 1,436 per year. Of these, 180 crashes, or 4.2 percent, resulted in 628 injured children (209 per year) being seen at a hospital. Only 7 children were admitted, while the rest were treated in the emergency room and released. The rate of 209 per year is substantially less than the 359 per year reported in the 2002-2003 STARS records. The difference could be related to the substantial number of children reported in the 2002-2003 STARS records who apparently had minor or possibly no injuries, as indicated by their injury level of 'probable injury but not apparent.' Other possibilities are that the special linking software did not link all the records it should have for the CODES database, or that some children were treated in doctors offices or clinics rather than hospitals, or that they were treated in hospitals outside Missouri that do not report their data to the DHSS.

A summary of the number of school bus crashes and children injured is located in Table 1.

Table 1
Number of School Bus Crashes and Children Injured in Missouri
STARS Crash Records, 2002-2003
CODES Data, 1999, 2001, 2003

Crash Information	STARS Crash Records, 2002-2003	CODES Data 1999, 2001, 2003
Number of Crashes	2,619 total or 1,310/year	4,307 total or 1,436/year
Number of Crashes in which Children Under Age 19 were Injured	167 (6.4%)	180 (4.2%)
Number of Buses that were in Crashes and had more than One Occupant	1,624	--
Number of above Buses in which at least one Child was Injured	168 (10.3%)	--

Depending on the year and the data source, about 4-7 percent of school bus crashes resulted in injuries to children and over 200 children per year were injured. Most of the injuries appeared to be minor. The CODES data indicated that only 7 of 628 children injured during the study period were admitted to a hospital, while the remaining 621 were treated in the emergency room and released. The STARS records for 2002-2003 noted that of the 718 children injured over the two year period, 584(81%) were recorded as having the lowest level of injury severity--'probable injury but not apparent.' According to both data sources, none of the children had died.

Table 2 summarizes the principle diagnosis for which the 628 injured children were seen at the emergency room or hospital. The principle diagnosis is determined by using the International Classification of Diseases, 9th Edition, Clinical Modification (ICD-9-CM). It is the system used by hospitals in most of the world to encode the diseases and injuries recorded in the patient's hospital record. Based upon the ICD-9-CM, the most frequent injuries were generally minor consisting of open wounds, abrasions and contusions, which accounted for slightly over a third of the injuries. One in five injuries was neck sprains, while other sprains and strains made up 12 percent. Fewer than 10 percent of the children had some type of head injury, and slightly under a half percent had injuries to the liver or spleen. Only 7 children were admitted to the hospital, while the rest were treated in the emergency room and released. Children were admitted for 'pain in the joint pelvis/thigh', 'cervicalgia' (pain in the neck), 'closed skull fracture without coma', 'liver hematoma/contusion', 'liver laceration unspecified', and 'unspecified injury trunk'. A complete list of the principle diagnoses for injured children in school buses is presented in Appendix A.

Table 2
Summary of Principle Diagnoses for Injured Children in School Buses*
Emergency Room and Inpatient Records
CODES Data for 1999, 2001 and 2003

Principal Diagnosis	Number of Children Injured	Percent
Injury to Liver, Spleen	3	0.4
Fractures	5	0.7
Pain	44	7.0
Injury to Head	52	8.2
Other, Vague	87	13.8
Neck Sprain/Strain/Pain	133	21.2
Other Sprains, Strains	75	11.9
Open Wound, Abrasion/Contusion	229	36.4
Total	628	99.6

* ICD-9-CM

In summary, it appears that the number of children injured in school bus crashes per year was somewhere between 200-360 per year for the time periods studied, with roughly 4-7 percent of crashes resulting in injured children. Slightly over 10 percent of buses that had more than one occupant and were involved in a crash resulted in an injury to one or more children. As indicated by the large number of injuries noted as ‘probable injury but not apparent’ and the nature of the injuries reported in the CODES data, most of the injuries do not appear to have been serious and only a few required hospitalization.

The School Bus Safety Task Force Fact-Finding Process

The task force conducted 7 meetings for a total of 38 hours. The first 5 meetings consisted of fact-finding in which the task force received briefings on:

- The licensing of school bus drivers – which included a live demonstration of the driving test process conducted by state license examiners.
- The pre-trip bus inspection process — a live demonstration of the entire process state law requires bus drivers to conduct daily.
- School bus safety inspection process – a live demonstration of the entire safety inspection process conducted by state motor vehicle inspectors.
- The results of the latest national research studies of the National Highway Transportation Safety Administration (NHTSA).
- Engineering and design safety features of buses to include compartmentalization, lap belts, lap-shoulder belts, energy dissipation design of body and frame, and issues relating to retro-fitting buses with belts.
- Terrorism directed at school buses.
- The role of the Missouri Department of Elementary and Secondary Education (DESE) in student transportation.

- The latest technology solutions being piloted and or implemented elsewhere in the United States to include video live-streaming via cellular communications, global position satellite tracking of students and buses, and remote activation of motorist warning signs posted at bus stops to name a few.
- School bus safety perspective from the National Association for Pupil Transportation (NAPT), the Missouri Association for Pupil Transportation (MAPT), and the Missouri School Bus Contractors Association (MSBCA). The results of an on-line survey of school bus drivers conducted by the Missouri Department of Public Safety.
- The results of a study requested by the task force conducted by the Missouri Department of Health and Senior Services on three years of accident data involving school buses in which students were reported as being injured.

A complete list of presenters and a brief summary of what they presented at the Task Force meetings is located in Appendix C. Appendix D contains a list of reports and studies provided and reviewed by Task Force members.

In an effort to seek input about school bus safety from a school bus driver's perspective, a questionnaire was developed and placed on the Department of Public Safety's website and distributed at selected school bus conferences and trainings. Of the 702 respondents, 559 cited an average of 11 ½ years of school bus driving experience. A copy of the questionnaire and the complete findings is located in Appendix E. The following is a list of selected findings from the survey.

1. Almost 89 percent of those respondents (496 Of 559) indicated their training was adequate.
2. Of the 702 drivers surveyed, 24 percent responded that they *did* see a need for lap and shoulder belts on large school buses. Many drivers (137) did not answer this question.
3. 63 percent of the drivers (445 of 702) *saw a need* for improving the "Monthly Safety Meeting" content and interest.
4. Drivers ranked the *most important* pieces of equipment that could be added to a school bus in the following order:
 - Two-way radios
 - Heated mirrors
 - Cameras on buses
 - Inside public address system
 - Strobe lights in stop arm lights and rest of the 8-way system
5. Drivers ranked the following training items from most important to least important.
 - Student discipline
 - Loading and unloading
 - Snow and ice driving
 - Skid training
 - Fire suppression

Recommendations and Findings:

Recommendations were developed in eight key areas. They include training, occupant protection, leadership and oversight, legislation, processes and procedures, security, other bus safety issues, and funding. In selected instances, focus areas were identified under these key areas. When appropriate and feasible, an agency(ies) was identified to assist in implementing the recommendation.

1. Training

There were three focus areas identified under training. They were school bus drivers; administrators, teachers and students; and other motorists.

TRAINING		
Focus Area	Recommendation	Responsible Agency
School Bus Drivers	Update the initial 40-hour state school bus driver trainer curriculum	Department of Elementary and Secondary Education (DESE)
	Develop a series of one-hour in-service driver trainer modules to be presented to drivers throughout the year.	DESE
Administrators, Teachers and Students	Provide annual training to all students and teachers regarding proper school bus loading and unloading procedures and proper behavior on the bus. The school shall verify to DESE that this has been accomplished.	School Districts
	Continue to provide school bus driver training for students on emergency evacuation each semester. Teachers and administrators shall reinforce and participate in this training each semester.	School Districts School Bus Drivers
Other Motorist	Continue and expand yearly public information campaigns by the Missouri State Highway Patrol (MSHP), Missouri Coalition for Roadway Safety (MCRS), Missouri Department of Transportation (MoDOT), and others to increase public awareness of school bus safety issues.	MSHP MCRS MoDOT Other advocacy groups

2. Occupant Protection

The two focus areas under occupant protection included equipment and technology. The National Highway Traffic Safety Administration 2002 study showed that the use of the combination lap/shoulder belts could provide some benefit unless misused. NHTSA's study stated:

Lap/shoulder belt systems could provide benefits to the passengers of school buses. Based on sled testing, lap/shoulder data indicate potential for fewer injuries in frontal crashes of selected severities, compared to the other two restraint systems

(compartmentalization and lap belts). This is especially true for the neck injury, where lap/shoulder belts produced substantially better results in comparison to lap belts and compartmentalization. Additionally, properly used lap/shoulder belt systems have the potential to be effective in reducing fatalities and injuries in other (non-frontal) crashes. Belt systems are particularly effective in reducing ejection in rollover crashes.

OCCUPANT PROTECTION		
Focus Area	Recommendation	Responsible Agency
Equipment	Combination lap/shoulder belts should not be retrofitted, instead installation should only be factory installed on new buses that are replacing the current fleet.	
	Lap belts are not recommended for general use on large school buses.	
	Lap belts or other approved securement devices may be necessary and appropriate in selected situations to secure child safety seats and to serve special needs students.	
	The Task Force recommends that in the absence of a legislative mandate, school districts are encouraged to consider replacing their fleet with school buses that have factory-installed combination lap/shoulder harness seat belts	
	It is further recommended that when a bus contains lap/shoulder seat belts, there be a statutory immunity to school districts, school bus operators, bus contractors, and their employees or agents (see “Legislation”).	
Technology	The Task Force recognizes that new technologies exist and are under development that, appear to have both safety and security benefit. School Districts are encouraged to investigate and stay apprised of these technologies.	

3. Leadership and Oversight

Recommendations were developed in three focus areas under leadership and oversight. They are: injury data collection, analysis and reporting processes, State Director of Transportation, and school bus task force.

LEADERSHIP & OVERSIGHT		
Focus Area	Recommendation	Responsible Agency
Injury Data Collection, Analysis and Reporting Processes	Carefully monitor school bus injuries and fatalities occurring both inside and outside the bus. The data would assist in making appropriate safety decisions.	The MSHP in coordination with the DESE and the Department of Health and Senior Services (DHSS) should: * Review available data, * Determine data and reporting gaps, and * As appropriate, expand data collection and reporting processes.
State Director of Transportation	Inasmuch as DESE previously had a state Director of Pupil Transportation with considerable support staff to guide, monitor, and supervise pupil transportation in Missouri, the task force recommends that this position be reinstated along with sufficient support personnel adequately funded to provide ongoing full-time leadership, oversight, training and support for school districts. Re-establishing the Director of Pupil Transportation will directly impact the timely implementation of the task force recommendations contained in this report.	
School Bus Task Force	Maintain and expand the role of the DESE's School Bus Safety Task Force.	DESE

4. Legislation

The focus areas identified under legislation included implementation and liability.

LEGISLATION		
Focus Area	Recommendation	Responsible Agency
Implementation	Any legislation introduced to require combination lap/shoulder belts on school buses, should allow school districts adequate time to plan, budget, and implement the transition.	
Liability	It is further recommended that when a bus contains combination lap/shoulder belts, there be a statutory immunity to school districts, school bus operators, or bus contractors, and their employees or agents for claims arising out of a child's use, non-use, or misuse of a seatbelt.	

5. Processes and Procedures

A number of processes and procedures were discussed. Recommendations were developed in the pre-trip inspection, monitoring loading/unloading zones, bus monitor, and school bus inspection areas.

PROCESSES & PROCEDURES		
Focus Area	Recommendation	Responsible Agency
Pre-trip Inspection	DESE in conjunction with school districts should continue to reconfirm/monitor that school bus pre-trip inspections are conducted uniformly and in accordance with state requirements.	DESE
Monitoring Loading and Unloading Zones	Schools shall ensure monitoring of students in loading/unloading zones on school premises by school personnel.	Local School Districts
Bus Monitors	School districts should explore opportunities to utilize bus monitors to observe student behavior on the buses thus enabling drivers to focus on driving.	Local School Districts
Inspection	The Missouri State Highway Patrol's school bus inspection program should be at least maintained if not expanded.	Missouri State Highway Patrol

6. Security

The Task Force finds that terrorist acts or other violent criminal acts directed at school buses are a possibility in the State of Missouri. As a result, efforts should be made to better prepare the school transportation system for this potential threat. Recommendations were identified in training, emergency planning and equipment.

SECURITY (To Include Terrorism)		
Focus Area	Recommendation	Responsible Agency
Training	Encourage and expand security training for transportation directors and school bus drivers.	Local School Districts
Emergency Planning	Coordinate with local law enforcement and emergency services personnel in ensuring adequate contingency plans are developed for terrorist and violent criminal acts directed at school buses.	Local School Districts Local Law Enforcement and Other Emergency Personnel
Safety/Security Equipment	Expand the use of safety/security equipment such as: <ul style="list-style-type: none"> ○ GPS Systems ○ Two Way Radios ○ Cameras ○ Inside/Outside PA Systems ○ Heated Mirrors 	Local School Districts

7. Other School Bus Safety Issues

Enhanced awareness and understanding of school bus safety traffic laws are important. High school driver education is a focus under the other bus safety issues area.

OTHER BUS SAFETY ISSUES		
Focus Area	Recommendation	Responsible Agency
High School Driver Education	Encourage the expansion of High School Driver Education during the regular school year as well as during the summer school to improve the safety of students outside the school bus by increasing the awareness and knowledge of the motoring public of bus safety traffic laws.	

8. Funding

The Task Force acknowledges that funding is a vital element in the safe and efficient operation of student transportation. As a result, the state should make every effort to incorporate the following recommendations.

FUNDING		
Focus Area	Recommendation	Responsible Agency
	Analyze the financial needs of school transportation in the state.	
	Take steps to work with local school districts to ensure adequate funding to fulfill the recommendations contained within this report.	

Appendix A

EXECUTIVE ORDER 05-14

WHEREAS, traffic and motor vehicle crashes cause numerous personal injuries and fatalities, as well as extensive property damage; and

WHEREAS, according to the National Traffic Safety Administration (NTSA), an average of 135 people die annually in school transportation related crashes, including an average of 22 school-age children fatalities per year; and

WHEREAS, according to traffic crash reports, nearly four school bus crashes a day occur in Missouri; and

WHEREAS, a fatal school bus crash occurred on May 12, 2005 in Liberty, Missouri, killing two people and injuring several students, sending two to the hospital; and

WHEREAS, also on May 12, 2005, a train struck a school bus from the Wentzville School District during a field trip to Hannibal, causing minor injuries to some of the 37 people aboard the bus; and

WHEREAS, the safety of school children who ride school buses must be a top priority of both state and local government officials.

NOW THEREFORE, I, Matt Blunt, Governor of Missouri, by virtue and authority vested in me by the Constitution and laws of the State of Missouri, do hereby create and establish the Missouri School Bus Safety Task Force.

The Task Force shall consist of nine (9) members appointed by the Governor. The Governor shall designate one (1) member to serve as chair. All members shall serve at the pleasure of the Governor.

Members of the Task Force shall receive no compensation for their service to the people of Missouri but may seek reimbursement for their reasonable and necessary expenses incurred as members of the Task Force, in accordance with the rules and regulations of the Office of Administration, to the extent that funds are available for such purpose.

The Task Force is assigned for administrative purposes to the Missouri Department of Transportation. The Director of the Missouri Department of Transportation shall be available to assist the Task Force as necessary, and shall provide the Task Force with any staff assistance the Task Force may require from time to time.

The Task Force shall meet at the call of its Chair, and the Chair shall call the first meeting of the Task Force as soon as possible.

The Task Force shall evaluate and make initial recommendations to me by August 15, 2005 on the following topics:

1. Developing strategies for improving school bus safety, including, but not limited to, programs or laws that have proven effective to reduce the incidents of school transportation-related accidents;
2. Analyzing current state and federal laws and programs governing school bus safety and recommending any changes that would enhance the effectiveness of these laws or programs;
3. Reviewing whether requiring seat belts in school buses would prove effective in reducing fatalities and injuries in school transportation-related accidents;
4. Recommending specific school bus safety legislation for possible consideration by the Missouri General Assembly; and
5. Recommending best practices or policies that could be implemented by state or local governments that would enhance school bus safety.

The Task Force shall prepare a final report and submit it to me by December 31, 2005. The Task Force shall expire on December 31, 2005.

IN WITNESS WHEREOF, I have hereunto set my hand and caused to be affixed the Great Seal of the State of Missouri, in the City of Jefferson, on this 17th day of May, 2005.

Matt Blunt
GOVERNOR

ATTEST:

Robin Carnahan
Secretary of State

Appendix B

Table 3
Principle Diagnoses for Injured Children, E/D and Inpatient Records
CODES Date for 1999, 2001, and 2003

Principal Diagnosis Code and Label	Frequency	Percent	Cumulative Frequency	Cumulative Percent
64893-OTHER CURRENT COND ANTEPARTUM	2	0.32	2	0.32
71941-PAIN IN JOINT SHOULDER	2	0.32	4	0.64
71945-PAIN IN JOINT PELVIS/THIGH (admitted)	1	0.16	5	0.80
71946-PAIN IN JOINT LOWER LEG	3	0.48	8	1.27
7231 –CERVICALGIA (1 admitted)	16	2.55	24	3.82
7235 -UNS TORTICOLLIS	1	0.16	25	3.98
7242 –LUMBAGO	3	0.48	28	4.46
7245 -BACKACHE UNSPECIFIED	4	0.64	32	5.10
7291 -UNS MYALGIA/MYOSITIS	4	0.64	36	5.73
7295 -PAIN IN LIMB	1	0.16	37	5.89
7840 –HEADACHE	9	1.43	46	7.32
78900-ABDOMINAL PAIN UNS SITE	2	0.32	48	7.64
78903-ABDOM PAIN R LOWER QUAD	1	0.16	49	7.80
8026 -FRACTURE ORBITAL FLOOR CLOSED	1	0.16	50	7.96
80301-CLOS SKULL FRACTURE OT WO COMA (admitted)	1	0.16	51	8.12
81002-CLOSED FRACTURE SHAFT CLAVICLE	1	0.16	52	8.28
81500-FRACTURE METACARPAL UNSP CLOSED	1	0.16	53	8.44
81503-FRACTURE METACARPAL SHAFT CLOS	1	0.16	54	8.60
82322-FRACTURE SHAFT FIB W TIB CLOS	1	0.16	55	8.76
8240 -FRACTURE MEDIAL MALLEOLUS CLOS	1	0.16	56	8.92
8404 -SPRAIN/STRAIN ROTATOR CUFF	1	0.16	57	9.08
8408 -SPRAIN/STRAIN SHOULDER/ARM OT	6	0.96	63	10.03
8409 -SPRAIN/STRAIN SHOULDER/ARM UNSPEC	4	0.64	67	10.67
8419 -SPRAIN/STRAIN ELBOW/FOREARM UNSPEC	1	0.16	68	10.83
84200-SPRAIN/STRAIN OF WRIST UNSPEC	2	0.32	70	11.15
8439 -SPRAIN/STRAIN HIP/THIGH UNSPEC	1	0.16	71	11.31
8448 -SPRAIN/STRAIN OF KNEE/LEG OT	1	0.16	72	11.46
8449 -SPRAIN/STRAIN OF KNEE/LEG UNSPEC	1	0.16	73	11.62
84500-SPRAIN/STRAIN OF ANKLE UNSPEC	1	0.16	74	11.78
8460 -SPRAIN/STRAIN LUMBOSACRAL	3	0.48	77	12.26
8469 -SPRAIN/STRAIN SACROILIAC UNSPEC	3	0.48	80	12.74
8470 -SPRAIN/STRAIN OF NECK	130	20.70	210	33.44
8471 -SPRAIN/STRAIN THORACIC REGION	13	2.07	223	35.51
8472 -SPRAIN/STRAIN LUMBAR REGION	17	2.71	240	38.22

Principal Diagnosis Code and Label	Frequency	Percent	Cumulative Frequency	Cumulative Percent
8479 -SPRAIN/STRAIN OF BACK UNSPEC	9	1.43	249	39.65
8483 -SPRAIN/STRAIN OF RIBS	1	0.16	250	39.81
8488 -SPRAIN/STRAIN OT	4	0.64	254	40.45
8489 -SPRAIN/STRAIN UNSPEC	7	1.11	261	41.56
8501 -CONCUSSION BRIEF COMA	3	0.48	264	42.04
85011-CONCUSSION W BRIEF LOSS CONSCIOUSNESS	1	0.16	265	42.20
85012-CONCUSSION W 31-59 MIN LOSS OF CONSCIOUSNESS	1	0.16	266	42.36
8505 -CONCUSSION W COMA UNSPEC	1	0.16	267	42.52
8509 -CONCUSSION UNSPEC	3	0.48	270	42.99
85206-SUBARACH HEMORRAGE COMA UNSPEC (admitted)	1	0.16	271	43.15
85400-INTRACRANIAL INJURY OT	4	0.64	275	43.79
85401-INTRACRANIAL INJURY OT WO COMA	4	0.64	279	44.43
86401-LIVER HEMATOMA/CONTUSION (admitted)	1	0.16	280	44.49
86405-LIVER LACERATION UNSPEC (admitted)	1	0.16	281	44.75
86500-SPLEEN INJURY UNSP WO OPEN WOUND	1	0.16	282	44.90
87201-OPEN WOUND OF AURICLE	1	0.16	283	45.06
8730 -OPEN WOUND OF SCALP	1	0.16	284	45.22
87342-OPEN WOUND OF FOREHEAD	1	0.16	285	45.38
87343-OPEN WOUND OF LIP	1	0.16	286	45.54
88000-OPEN WOUND OF SHOULDER	1	0.16	287	45.70
88101-OPEN WOUND OF ELBOW	4	0.64	291	46.34
8910 -OPEN WOUND KNEE/LEG/ANKLE	1	0.16	292	46.50
9100 -ABRASION HEAD	2	0.32	294	46.82
9108 -SUPERFICIAL INJURY HEAD OT	1	0.16	295	46.97
9110 -ABRASION TRUNK	2	0.32	297	47.29
9160 -ABRASION HIP/LEG	4	0.64	301	47.93
9170 -ABRASION FOOT/TOE	1	0.16	302	48.09
9180 -SUPERFICIAL INJURY PERIOCLAR	1	0.16	303	48.25
9189 -SUPERFICIAL INJURY EYE OT	3	0.48	306	48.73
920 -CONTUSION FACE/SCALP/NCK	83	13.22	389	61.94
9211 -CONTUSION OF EYELIDS/PERIOCLAR	1	0.16	390	62.10
9219 -UNSPEC CONTUSION OF EYEBALL	1	0.16	391	62.26
9221 -CONTUSION OF CHEST WALL	13	2.07	404	64.33
9222 -CONTUSION OF ABDOMINAL WALL	3	0.48	407	64.81
92231-CONTUSION OF BACK	17	2.71	424	67.52
9229 -CONTUSION OF UNS PART TRUNK	1	0.16	425	67.68
92300-CONTUSION OF SHOULDER REGION	19	3.03	444	70.70
92301-CONTUSION OF SCAPULAR REGION	1	0.16	445	70.86
92302-CONTUSION OF AXILLARY REGION	1	0.16	446	71.02
92303-CONTUSION OF UPPER ARM	2	0.32	448	71.34

Principal Diagnosis Code and Label	Frequency	Percent	Cumulative Frequency	Cumulative Percent
92311-CONTUSION OF ELBOW	6	0.96	454	72.29
92321-CONTUSION OF WRIST	1	0.16	455	72.45
9239 -CONTUSION OF UNS PART UPPER LIMB	4	0.64	459	73.09
92400-CONTUSION OF THIGH	6	0.96	465	74.04
92401-CONTUSION OF HIP	6	0.96	471	75.00
92410-CONTUSION OF LOWER LEG	7	1.11	478	76.11
92411-CONTUSION OF KNEE	13	2.07	491	78.18
92421-CONTUSION OF ANKLE	4	0.64	495	78.82
9245 -CONTUSION OF UNS PART LOWER LIMB	3	0.48	498	79.30
9248 -CONTUSION OF MULTIPLE SITES NEC	10	1.59	508	80.89
9249 -CONTUSION OF UNS SITE	3	0.48	511	81.37
95901-UNS HEAD INJURY	32	5.10	543	86.46
95909-INJURY FACE/NECK	7	1.11	550	87.58
9591 -OTH/UNS INJURY TRUNK (admitted)	8	1.27	558	88.85
9592 -OTH/UNS INJURY SHOULDER/UPPER ARM	3	0.48	561	89.33
9593 -OTH/UNS INJURY ELBOW FOREARM/WRIST	1	0.16	562	89.49
9597 -OTH/UNS INJURY KNEE LEG ANKLE/FOOT	5	0.80	567	90.29
9598 -INJURY OTHER SITES INC MULT SITES	5	0.80	572	91.08
9599 -INJURY UNS SITE	2	0.32	574	91.40
V655 -PERSON W FEARED COMPLAINT NO DX	1	0.16	575	91.56
V714 -OBSERV FOLLOWING OTH ACCIDENT	51	8.12	626	99.68
V7189-OBSERV FOR OTHER SUSPECT CONDITION	1	0.16	627	99.84
V719 -OBSERV UNS SUSPECTED CONDITION	1	0.16	628	100.00

Appendix C

Presenters and Subjects Heard by the Task Force

Presenter	Date	Subject
Colonel Roger Stottlemire Superintendent MO State Highway Patrol Jefferson City, Missouri	May 26	Overview of school bus safety, driver testing, safety inspections, criminal background checks, collection of crash data, and public information and education.
Lt. David Perkins MO State Highway Patrol Jefferson City, Missouri	May 26	Provided a power point presentation on school bus safety and then gave the task force members an actual demonstration of a school bus inspection and we participated in an actual school bus drivers test.
Captain Bill Nelson MO State Highway Patrol Jefferson City, Missouri	May 26	Presented the driver-testing procedures, listed the types of primary and secondary identification needed for applicants and provided copies of the driver-testing handbook.
Lt. Tim Hull MO State Highway Patrol Jefferson City, Missouri	May 26	Update on seat belts and school bus safety, an ongoing debate for thirty years.
Charles Gauthier Executive Director National Assn. Of State Directors of Pupil Transportation Services The Plains, Virginia	June 9	Provided a power point presentation on occupant protection and security issues on school buses.

Presenter	Date	Subject
Bob Douglas, Director Product Integrity IC Corporation Conway, Arkansas	June 9	Provided a power point presentation on the integrity of the school bus.
Tom Quinn, Director School Governance Dept. of Elementary & Secondary Education (DESE) Debra Clink School Finance/Transportation Consultant Dept. of Elementary & Secondary Education Jefferson City, Missouri	June 23	Power point presentation on School Transportation Overview; Calculation of Application for State Transportation Aid; Administrators Handbook; 2002 Missouri Minimum Standards for School Buses Booklet.
John Davies Director of Transportation Independence School District Independence, MO 64050	June 23	Economic Impact on Missouri School Districts with the Independence School District given as an example.
Pamela Hoelscher, Operations Specialist Highway Safety Division Missouri Department of Transportation Jefferson City, Missouri	June 23	Presentation on Child Passenger Safety and provided a copy of the School Bus Passenger Crash Protection – Results of Crash Test Research and Future Actions by the National Highway Traffic Safety Administration (NHTSA). Also provided a copy of the NHTSA Report to Congress on the safety of riding in a school bus.
Gina Wisch MO Department of Revenue Jefferson City, Missouri	June 23	Presentation on School Bus Endorsement Requirements by Dept. of Revenue; Drivers License Bureau Rules;

Presenter	Date	Subject
Mark Van Tuinen, Chief Bureau of Health Services Statistics MO Department of Health and Senior Services	July 7	Provided information on school bus safety and school transportation related crashes.
James Freed Midwest Regional Director National Coalition for School Bus Safety Kansas City, MO	July 7	Provided information on school bus safety and school transportation related crashes.
Stan Burnett Director of Marketing IntelliStrobe Safety Systems 4136 South McCann Ct. Springfield, MO 65804	July 28	Provided a presentation on remotely activated warning lights for school safety signs. Lights are coded from the bus to the signs and stay on for a pre-set time.

Appendix D

Research Studies, Reports, and Product Information Reviewed by the Task Force

The task force reviewed and considered the following reports, papers, and studies from May 26, 2005 through July 28, 2005:

- Power point presentation on School Bus Safety, the Role of the Highway Patrol
- National Highway Traffic Safety Administration, Paper No 313
“Large School Bus Safety Restraint Evaluation – Phase II”
- Florida Association for Pupil Transportation Position Paper, February 2005.
“Passenger Restraints In Large School Buses”
- National Highway Traffic Safety Administration Report, April 2002.
“School Bus Crashworthiness Research Report”
- National Highway Traffic Safety Administration Website
www.nhtsa.dot.gov/people/injury/buses/pub/seatbelt.hmp.html
- National Conference of State Legislators – Excerpt from:
“Protecting Children: A Guide to Child Traffic Safety Laws”
- National Association of State Directors of Pupil Transportation Services,
8/26/02. “Enhancing School Bus Safety and Pupil Transportation Safety”
- Statement Issued by the Presidents of:
National Association for Pupil Transportation
National Association of State Directors of Pupil Transportation Services
National School Transportation Association
“Passenger Crash Protection in Large School Buses, May 16, 2005”
- New York’s School Bus Seat Belt Law, taken from the Internet
- New Jersey’s School Bus Seat Belt Law, taken from the Internet
- Florida’s School Bus Safety Restraint Statute 316.6145
- California’s State Code
- Vermont’s Child Passenger Safety Laws
- Minnesota’s Statutes 2004 – 169.447 School Bus and Head Start Bus Safety

- Year-to-Date 2005 Missouri Traffic Crashes – School Bus Involvement
- Motor Vehicle Inspection Division School Bus Inspection Program
2005 Annual Report
- Missouri Motor Vehicle Inspection Regulations
- National Association of State Directors of Pupil Transportation Services
Information Report “Sharing Student Health & Medical Information with
School Transporters”
- National Association of State Director of Pupil Transportation Services
“Safety Harnesses and School Buses”
- MO State Highway Patrol Public Service Announcements
- MO State Highway Patrol Safety Games – Bus Safety Grades 5 & 6
- MO State Highway Patrol “Bumper” The Talking Patrol Car and “Buster”
The
School Bus Coloring Book
- “Unreported Miracles” by Dr. Cal LeMon
- 2005 Missouri Driver Guide
- School Bus Operator’s Permit Procedure Manual
- Missouri Commercial Driver License Manual
- School Bus Endorsement/Permit Study Manual (For Testing Effective Jan.
2005)
- National Highway Traffic Safety Administration School Bus Report to
Congress, May 7, 2002
- National Highway Traffic Safety Administration DOT HS 806 965 Final
Report, “School Bus Safety Belts: Their Use, Carryover Effects and
Administrative Issues”
- “Occupant Protection and Security Issues” Power Point presentation:
- “Integrity of the School Bus Body Design” Power Point presentation:

- Missouri Department of Elementary & Secondary Education (DESE):
 “School Transportation Overview” – Power Point
 “Calculation of Application for State Transportation Aid”
 “Administrator’s Handbook” Revised October 2004
 “2002 Missouri Minimum Standards for School Buses”
- Cost Comparison Paper, Independence School District – comparing no seat belts to 3-point belts with 3-2 seating
- Child Passenger Safety for School Buses – Power Point
 School Bus Passenger Crash Protection – Results of Crash Test Research & Future Actions by the National Highway Traffic Safety Administration
- Overview of the Motor Carrier Safety Improvement Act – Missouri Department of Revenue School Bus Endorsement Requirements
- Code of State Regulations – Drivers License Bureau 12 CSR 10-24.160
- Nextel Corporation - School Bus Solutions K-12 Student Transportation
- Crash/Injury Data on School Bus Crashes from 1999-2001-2003
- School Bus Safety – National Coalition for School Bus Safety
- IntelliStrobe School Bus Stop Safety System

Appendix E

School Bus Driver Survey and Results

Questions for School Bus Driver Survey

These questions are restricted to safety equipment and driver training.

1. Do you see a need for lap-shoulder belts on large school buses? YES NO
2. If you were hired in the last 8 years do you feel your initial training was adequate? YES
NO
3. Despite the fact that continuing training can be repetitious, do you see a need for improving the “Monthly Safety Meeting” content and interest. YES NO
4. Do you see a need for motion sensors under the bus? YES NO
5. Prioritize the following pieces of equipment that could be added to the bus from 1 to ...
 - a. Heated Mirrors
 - b. Two-way radios
 - c. Camera’s on all buses
 - d. Inside PA System
 - e. Outside PA System
 - f. GPS systems
 - g. Strobe lights on top of bus
 - h. Strobe lights in stop arm lights and the rest of the 8-way system
 - i. Other:_____
6. Prioritize the following:
 - a. State system of public school bus safety awareness announcements
 - b. Return of the Driver Education requirement in High school
 - c. Uniform Enforcement of Stop Arm passing law
7. Prioritize the following training items:
 - a. Skid training
 - b. Fire suppression
 - c. Snow and Ice driving
 - d. Loading & Unloading
 - e. Student discipline
 - f. Other:_____

Survey Interpretation

How long have you been a bus driver?

- 559 respondents marked their years of driving experience on the survey. Their average years of experience totaled 11.67, and the median years of driving experience was 8 years. The newest driver had one month of experience and the most experienced driver had 48 years of experience.
- These 559 respondents have a combined 5,968 years of driving experience.

Was your training adequate?

- Almost 89% of those respondents (496 of 559) said their training *was adequate*. 9% of drivers (53 of 559) replied their training was *not adequate*.

1. Do you see a need for lap-shoulder belts on large school buses?

- Of 702 drivers surveyed, nearly 58% (404 of 702) *did not see* a need for lap or shoulder belts on large school buses. 24 % (171 of 702) responded that they *did see* a need for lap or shoulder belts on large school buses. Many drivers did not answer this question.

2. If you were hired in the last 8 years, do you feel your initial training was adequate?

- Nearly 65% of drivers (456 of 702) hired in the past 8 years felt their initial training *was adequate*. Nearly 7% (46 of 702) responded that their initial training was *not adequate*.
- One respondent felt his or her training was adequate, but added, “You need student training.”
- One driver did not mark “yes” or “no,” but instead wrote “so-so.”

3. Despite the fact that continuing training can be repetitious, do you see a need for improving the “Monthly Safety Meeting” content and interest?

- 63% of drivers (445 of 702) *saw a need* for improving the “Monthly Safety Meeting” content and interest. 34% of drivers (240 of 702) responded that they *did not see a need* for improving the “Monthly Safety Meeting” content and interest.
- One driver asked for more “up to date videos,” one noted the “Monthly Safety Meetings” were “boring,” and one said, “we don’t have these.”
- One driver said, “Safety meetings should be for all drivers—some drivers never attend and the ones that bring their small children to these meetings should find a place for their children.”
- Another driver noted, “New materials need to be developed and distributed.”

4. Do you see a need for motion sensors under the bus?

- 56% of drivers (394 of 702) responded they *did not* see a need for motion sensors under the bus. Nearly 38% of drivers (270 of 702) replied they *did* see a need for motion sensors under the bus.

5. Prioritize from 1 to 9, the following pieces of equipment that could be added to the bus, with 1 being the most important and 9 being the least important:

- Using a points system, it was found that drivers rank pieces of equipment that could be added to a bus in the following order:
 - Two-way radios
 - Heated mirrors
 - Cameras on all buses
 - Inside PA system
 - Strobe lights in stop arm lights and rest of the 8-way system
 - Strobe lights on top of bus
 - Outside PA system
 - GPS system
 - Other
- One driver noted, “Strobe lights mess up pace makers and other rhythm of people with heart problems.”
- Another driver wrote that strobe lights were “very blinding when following another bus.”
- 12 respondents who ranked “other” as their number one priority made comments about more state funds for buses, bus driver salary and benefits.
- An additional 48 respondents said “funding,” “money,” or “funding for three-point system seatbelts” was a priority.
- 22 respondents who ranked “other” as an important priority suggested having adult aides, bus monitors, or district personnel on each bus.
- More comments listed under “other” include:
 - Digital pre-trip inspection system which logs by a computer and handheld terminal and if not done, bus can’t leave
 - CPR/First Aid training
 - Fog lights/front bumper lights
 - Back up warning eye
 - Mirrors reflecting the back of the bus
 - Mirrors reflecting to allow driver to see the back seats on the inside of the bus
 - Air conditioning
 - Cell phones
 - Lighter plug for telephone
 - Stop arms at front and back of bus
 - Wiper delay
 - Cameras on stop arm to catch cars that run stop arms
 - Child guard in front of right rear wheel
 - Sound depressing equipment
 - Flashing headlamps
 - Sweep arms in front of bus
 - Drivers box for paperwork/personal items
 - Map light for reading route sheets
 - Wider step area for flat nose buses

- One driver suggested, “More monthly training at safety meetings. Many drivers are in the dark in so many new driving laws and ways of driving conditions that happen, that when they are hit, they are in the dark on what to do, so for this letter to say training is repetitious is wrong!”
- Another driver suggested, “Safety meetings that keep drivers up to date on updated training programs. Most bus barns just do the minimum training and it is not enough.”
- One driver listed, “A specific time for drivers to go over rules and expectations with the students at the beginning of the school year.”
- Another driver suggested, “Seatbelts on the first two rows that we can use at our discretion, without parent, administration permission...if we feel it’s a safety factor.”
- Another driver noted, “Funding—additional equipment costs money!”
- One driver noted, “There should be a physical requirement for drivers to be able to lift a child in case of an emergency and the ability to walk to the back of the bus to help children (example—bad knees, weak legs and ankles, bad backs, etc.). Other jobs require certain physical abilities.”

6. Prioritize the following from 1 to 3, with 1 being the most important and 3 being the least important:

- Using a points system, it was found that drivers rank accordingly (from most important to least important):
 - Uniform enforcement of Stop Arm Passing Law
 - Return of the Driver Education requirements in High School
 - State System of public school bus safety awareness announcements

7. Prioritize the following training items from 1 to 6, with 1 being the most important and 6 being the least important:

- Using a points system, it was found that drivers ranked accordingly (from most important to least important):
 - Student discipline
 - Loading and unloading
 - Snow and ice driving
 - Skid training
 - Fire suppression
 - Other
- Drivers also thought the following things should be considered in training under “other”:
 - Tornado and storm
 - Parents, how to deal with them
 - Reference point driving
 - Parents/Intruders on bus
 - Railroad crossings
 - Maneuvering—backing up using only mirrors
 - Pre-trip inspection
 - Bus evacuation

- Security awareness
- Updates on school policy
- Crisis Training
- Hostage Situations
- Maintaining proper mirror adjustment and constant traffic checks
- Liability issues
- High water crossing
- Reaction to mechanical failure like loss of brakes/acceleration sticking
- Construction/obstruction obstacles
- Multiple drivers suggested students be trained in school bus safety at school or even at P.T.A. meetings, including teachers.
 - One driver noted, “Better in-classroom/in-school training, so students have a better idea of safety, with a program the whole state follows.”
 - Another said, “Students need to have a class on how important it is for them to know the rules.”
 - Another said, “Teaching students what to do in an emergency situation and evacuation. Student discipline and loading and unloading should be equally important for driver and students, it is for the safety of each individual.”
- 5 drivers suggested having bus aides/monitors ride along on the routes.
- Many drivers added comments about discipline, including:
 - “Discipline is our biggest problems, children have no respect for drivers.”
 - “Discipline is a major problem”
 - “Student (all) class on discipline while riding bus.”
- One driver requested “more handicap monitors and drivers.
- 6 drivers listed funding under “other.”